

Bioassays of the Town of

Callahan Wastewater Treatment Plant

Callahan, Nassau County, Florida

NPDES #FL0038407

Sampled 11/2/92

December 1992

Biology Section
Division of Technical Services

Bioassays of the Town of

Callahan Wastewater Treatment Plant

Callahan, Nassau County, Florida

NPDES #FL0038407

Biology Section
Bureau of Laboratories
December 1992

Introduction

Town of Callahan WWTP, Callahan, Nassau County, Florida, NPDES #FL0038407, tests performed on 3 to 5 November, 1992.

This facility is located on East Brandies Avenue in Callahan. The facility is permitted to operate a 0.30-mgd capacity rotating biological-contact wastewater treatment system with chlorine disinfection and dechlorination. Discharge of dechlorinated effluent is to Alligator Creek, which is a tributary of the Nassau River (NPDES files).

The toxicity tests discussed in this report were performed in accordance with methods described by Weber, 1991, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, 4th Edition, EPA/600/4-90/027.

Results and Discussion

The FDER Biology Section performed two 48-hour static acute screening toxicity bioassays with a sample of effluent from this facility. The bioassay organisms used for these tests were the water flea, *Ceriodaphnia dubia*, and the bannerfin shiner, *Notropis leedsi*. The test results did not indicate toxicity since no mortality occurred in either test.

Total residual chlorine of the sample was < 0.1 mg/L in the field and 0.01 mg/L in the laboratory. Total and unionized ammonia concentrations were 0.68 mg/L and < 0.01 mg/L, respectively.

Conclusion

The sample of effluent collected from this facility on 2 November, 1992, did not show toxicity.

Table 1. Concentration series and volumes used for the 48-hour static acute screening bioassays of the Town of Callahan WWTP effluent performed on 3 to 5 November, 1992.

Ceriodaphnia dubia (water flea)

Concentration	Dilution Water	Sample	Total Volume
Control	20 mL	0 mL	20 mL
100 %	0 mL	20 mL	20 mL

Notropis leedsi (bannerfin shiner)

Concentration	Dilution Water	Sample	Total Volume
Control	500 mL	0 mL	500 mL
100 %	0 mL	500 mL	500 mL

Table 2. Data recorded during the 48-hour acute screening bioassays of a sample of effluent from the Town of Callahan WWTP, Callahan, Nassau County, Florida, NPDES# FL0038407, performed on 3 to 5 November, 1992.

Facility:	**Town of Callahan WWTP**		**NPDES #**	**FL0038407**	Facility Type: **wastewater treatment**
Location:	Callahan		Contact/District:	Jeff Martin / NE	
County:	Nassau		Test type:	static acute screen	
Sample Collection Date:	**11/2/92**	Time: 1200	# tests:	2	Receiving Water: Alligator Creek to
Test Beginning Date:	11/3/92	Time: 1355	Chlorination Type:	**Sample collected**	Nassau River
Test Ending Date:	11/5/92	Time: 1400		**after dechlorination**	**Page 1 of 1**

Total Residual Cl2	mg/l	Method
Field:	<0.1	Hach
Lab:	0.0	DR-100

Ammonia	Total (mg/l)	Unionized (mg/l)
Control Water (fish):	0.34	< 0.01
20% Dilute Mineral Water (cladocerans):	0.40	< 0.01
100% Sample:	0.68	< 0.01

Alk & Hardness	Alkalinity (mg/l)	Hardness (mg/l)
Control Water (fish):	119	118
20% Dilute Mineral Water (cladocerans):	70	88
100% Sample:	144	273

Salinity (ppt)	
Control Water:	0
100% Sample:	0

Organism: ***Ceriodaphnia dubia*** Life stage: < 24 hours old

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control	5	5	5	8.0	-	8.1	23.1	-	24.3	8.8	-	8.4	170	175
Control	5	5	5	-	-	8.1	-	-	-	-	-	8.4	-	-
Control	5	5	5	-	-	8.1	-	-	-	-	-	8.4	-	-
Control	5	5	5	-	-	8.1	-	-	-	-	-	8.4	-	-
100%	5	5	5	7.4	-	8.4	23.0	-	24.7	8.5	-	8.2	720	755
100%	5	5	5	-	-	8.4	-	-	-	-	-	8.2	-	-
100%	5	5	5	-	-	8.4	-	-	-	-	-	8.2	-	-
100%	5	5	5	-	-	8.4	-	-	-	-	-	8.2	-	-

Organism: ***Notropis leedsi*** Age: 11 days

	SURVIVAL			pH			Temperature			Dissolved Oxygen			Conductivity	
Concentrations	# at 0 hr	Live at 24 hr	Live at 48 hr	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	24 hour	48 hour	0 hour	48 hour
Control	5	5	5	7.9	8.0	8.2	23.0	23.9	23.8	8.5	7.6	8.1	240	245
Control	5	5	5	7.8	8.1	8.2	-	-	-	8.6	7.6	8.1	240	240
100%	5	5	5	7.2	7.7	7.8	22.5	23.9	23.8	8.3	6.1	6.2	750	760
100%	5	5	5	7.2	7.6	7.8	-	-	-	8.3	5.8	6.2	755	775

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Town of Callahan WWTP
Address/City:
County: NASSAU
Contact/District:
NPDES Permit #: FL00 38407 Outfall #:

Sample Collection: Date 11/2/92 Time 1200
Test Beginning: Date 11/3/92 Time 1355
Test Ending: Date 11-5-92 Time 1400
Test Organism: Ceriodaphnia dubia
Life Stage/Age: < 24 hrs

Test Number: 1 of 2 Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

44254 92-NOV-03-21
verified 11-5-92 KP

Remarks:

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7@7, 9@9	8.5@23.7	23.8@23.8	960 9600 @24.2
24 hr	7@7, 9@9	8.5@24.0	24.0@24.0	960 9700 @24.0
48 hr	7@7, 9@9	8.5@23.9	23.9@23.7	960 9650 @24.0

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	A	5	5	5	8.0		8.1	23.1		24.3	8.8		8.4	170		175
Control	B	5	5	5			8.1						8.4			
Control	C	5	5	5			8.1						8.4			
Control	D	5	5	5			8.1						8.4			
100%	A	5	5	5	7.3		8.4	23.0		24.7	8.5		8.2	720		755
100%	B	5	5	5			8.4						8.2			
100%	C	5	5	5			8.4						8.2			
100%	D	5	5	5			8.4						8.2			
Measured/Loaded by:		MF	MF	TM	TM		MF	TM		MF	TM			TM		MF
Recorded by:		MF	MF	MF	KP		TM	KP		TM	KP			KP		TM

Investigators' Signatures

Mashell Faircloth
Ting Mikulski
Kim Pearce
Tobin Rader
Reviewer

Water-quality Parameters

	Well Water	20% Cond. Water	Sample	Method	Measured by
Field Tot. Resid. Cl2:			20.1	Hach	JM
Lab Tot. Resid. Cl2:	0.02	0.01	0.01	DR100	TM
Alkalinity:	119	70	144	Hach	TR
Hardness:	118	88	273	Hach	TR
Total Ammonia:	.34	.40	.68	Orion	MF

Ammonia Meter Slope: -55
Ammonia Blank: 0.0
Salinity Sample: _____ ppt

DER Biology Section — Acute Bioassay Bench Sheet

Sample Source: Town of Callahan
Address/City:
County: NASSAU
Contact/District:
NPDES Permit #: FL00 38407 Outfall #:

Sample Collection: Date 11/2/92 Time 1200
Test Beginning: Date 11/3/92 Time 1355
Test Ending: Date 11-5-92 Time 1400
Test Organism: Mysidopsis bahia
Life Stage/Age: 11 days

Test Number: 2 of 2 Test Type: (Screening) | Definitive
(Static) | Static Renewal | Flow-through

44254 92-NOV-03-21
verified 11-5-92 KP

Remarks:

Instrument Calibrations:

	pH	DO	Temp	Cond
0 hr	7.7.9.9	8.5@23.7	23.8@23.8	960 @24.2 9600
24 hr	7@7.9@9	8.5@24.0	24.0@24.0	960 @24.0 9700
48 hr	7@7.9@9	8.5@23.9	23.9@23.7	960 @24.0 9650

Conc.	Chamber #	Number Live 0	24	48	pH 0	24	48	Temp. (°C) 0	24	48	DO (mg/L) 0	24	48	Cond. (µmhos/cm) 0	24	48
Control	15	5	5	5	7.9	8.0	8.2	23.0	23.9	23.8	8.5	7.6	8.1	240	245	245
Control	25	5	5	5	7.8	8.1	8.2				8.6	7.6	8.1	240	245	240
100%	153	5	5	5	7.2	7.1	7.8	22.5	23.9	23.8	8.3	7.7	6.2	750	765	760
100%	183	5	5	5	7.2	7.6	7.8				8.3		6.2	755	775	775
											* incorrect					
											recording		11/4/92			
											#153	6.1	TR			
											#183	5.8				
Measured/Loaded by:		MF	MF	MF	TM	TM	MF	TM	TM	MF	TM	TM	MF	TM	TM	MF
Recorded by:		MF	MF	MF	KP	TR	TM	KP	TR	TM	KP	TR	TM	KP	TR	TM

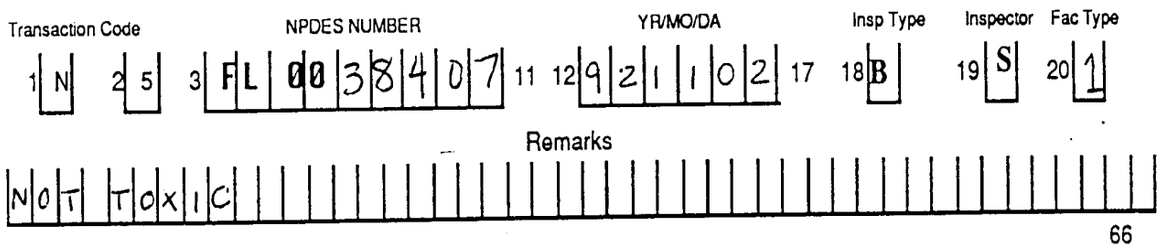
Investigators' Signatures
Marbell Faucett
Tina Mikulski
Kim Pearce
Tobin Rader
Reviewer

Water-quality Parameters

	Well Water	Cond. Water (202)	Sample	Method	Measured by
Field Tot. Resid. Cl2:			<0.1	Hach	TM
Lab Tot. Resid. Cl2:	0.02	0.01	0.01	DR 100	TM
Alkalinity:	119	70	144	Hach	TR
Hardness:	118	88	273	Hach	TR
Total Ammonia:	.34	.40	.68	Orion	MF

Ammonia Meter Slope: -55
Ammonia Blank: 0.0
Salinity Sample: _____ ppt

Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI - RI Optional)



Fill Out This Section For All Surface Water Discharger Inspections (CEI, CSI, CBI, PAI, XSI - RI Optional)

